

THE INVENTION CLAIMED IS

1. An optical element, comprising:
 - a non-planar profile substrate,
 - an adhesion layer, having a predetermined thickness deposited on said non-planar profile,
 - a layer comprising silver, having a predetermined thickness deposited on said adhesion layer; and
 - a passivation layer, having a predetermined thickness deposited on said silver layer.
2. The optical element of claim 1, wherein said non-planar profile comprises at least one profile selected from sinusoidal, triangular and rectangular profiles.
3. The optical element of claim 1, wherein said silver layer comprises a thickness in the range from about 1000 to about 10,000 Angstroms.
4. The optical element of claim 1, wherein said adhesion layer comprises a thickness in the range from about 3 to about 300 angstroms.
5. The optical element of claim 1, wherein said passivation layer comprises a thickness in the range from about 3 to about 10 angstroms.
6. The optical element of claim 1, wherein said adhesion layer comprises at least one material selected from the group consisting of: nickel, nickel

nitride, chromium, chromium nitride, nickel-chromium alloys, silicon-nitride, and nickel-chromium nitride.

7. The optical element of claim 1, wherein said passivation layer comprises at least material selected from the group consisting of: nickel, nickel nitride, chromium, chromium nitride, nickel-chromium alloys, silicon-nitride, and nickel-chromium nitride.

8. The optical element of claim 1, wherein said optical element includes a diffraction efficiency of greater than about 90% for a predetermined spectral range.

9. An optical element, comprising:

 a diffraction grating,

 an adhesion layer having a predetermined thickness deposited on said diffraction grating, wherein said adhesion layer comprises at least one material selected from the group consisting of: nickel, nickel nitride, chromium, chromium nitride, nickel-chromium alloys, silicon-nitride, and nickel-chromium nitride,

 a layer comprising silver having a predetermined thickness deposited on said adhesion layer,

 a passivation layer having a predetermined thickness deposited on said silver layer, wherein said passivation layer comprises at least material selected from the group consisting of: nickel, nickel nitride, chromium, chromium nitride, nickel-chromium alloys, silicon-nitride, and nickel-chromium nitride; and

wherein a diffraction efficiency of greater than about 90% is achieved over a predetermined spectral range.

10. The optical element of claim 9, wherein said diffraction grating comprises at least one profile selected from sinusoidal, triangular and rectangular profiles.

11. The optical element of claim 10, wherein said silver layer comprises a thickness in the range from about 1000 to about 10,000 angstroms.

12. The optical element of claim 9, wherein said adhesion layer comprises a thickness in the range from about 3 to about 300 angstroms.

13. The optical element of claim 9, wherein said passivation layer comprises a thickness in the range from about 3 to about 10 angstroms.

14. The optical element of claim 9, wherein at least one durability layer is deposited on said passivation layer.

15. The optical element of claim 14, wherein said durability layer comprises at least one nitride selected from the group consisting of: silicon nitride, aluminum nitride, and silicon aluminum nitride.

16. The optical element of claim 15, wherein said durability layer further comprises an oxinitride layer deposited on said nitride layer.

17. The optical element of claim 15, wherein said durability layer further comprises a plurality of layers of metal oxides.

18. The optical element of claim 14, wherein said durability layers deposited on the passivation layer comprise a layer of silicon nitride, a layer of silicon oxinitride, and a layer of silicon dioxide.

19. The optical element of claim of 14, wherein the durability layers deposited on the passivation layer comprise a layer of silicon aluminum nitride, a layer of silicon oxinitride, and a layer of silicon dioxide.

20. The optical element of claim 14, wherein the durability layers deposited on the passivation layer comprise a layer of aluminum nitride, a layer of aluminum oxinitride, and a layer of aluminum oxide.

21. The optical element of claim 14, wherein the durability layers comprise a plurality of layers of metal oxides.

22. The optical element of claim 21, wherein the durability layers comprise metal oxides selected from the group consisting of: silicon dioxide, titanium dioxide, aluminum oxide, tantalum hafnium oxide, tantalum oxide, niobium oxide, zirconium oxide, and mixtures thereof.

23. A method, comprising:
providing a non-planar profile substrate,

depositing an adhesion layer having a predetermined thickness on said non-planar profile, wherein said adhesion layer comprises at least one material selected from the group consisting of: nickel, nickel nitride, chromium, chromium nitride, nickel-chromium alloys, silicon-nitride, and nickel-chromium nitride,

depositing a layer of silver having a predetermined thickness on said adhesion layer; and

depositing a passivation layer having a predetermined thickness on said silver layer, wherein said passivation layer comprises at least one material selected from the group consisting of: nickel, nickel nitride, chromium, chromium nitride, nickel-chromium alloys, silicon-nitride, and nickel-chromium nitride.

24. The method of claim 23, wherein said adhesion layer comprises a thickness in the range from about 3 to about 300 angstroms.

25. The method of claim 23, wherein said passivation layer comprises a thickness in the range from about 3 to about 10 angstroms.

26. The method of claim 23, wherein at least one durability layer is deposited on said passivation layer.

27. The method of claim 23, wherein said silver layer comprises a thickness in the range from about 1000 to about 10,000 angstroms.

28. The method of claim 23, wherein said non-planar profile comprises at least one profile selected from sinusoidal, triangular and rectangular profiles.

29. The method of claim 23, wherein said non-planar profile includes a diffraction grating.